What is claimed is:

1. A method for analyzing a flip chip die, the method comprising:

providing a flip chip die having a back side opposite circuitry at a circuit side and having a liquid crystal layer formed over a thinned region in the back side;

generating heat in the die circuitry; and

detecting a defect in the die by detecting a portion of the liquid crystal changing phase.

2. The method of claim 1, wherein providing a flip chip die having a liquid crystal layer formed over a thinned region in the back side comprises:

removing at least a portion of substrate from the back side and forming the thinned region; and

forming a liquid crystal layer over at least a portion of the thinned region.

3. The method of claim 2, wherein removing at least a portion of substrate from the back side and forming the thinned region includes removing an amount of substrate sufficient to allow heat transfer for the liquid crystal analysis while not allowing the die to be damaged during removal from a package.

4. The method of claim 2, wherein removing at least a portion of substrate from the back side and forming the thinned region includes forming a thinned region having sufficient roughness to facilitate the formation of the liquid crystal layer.

5. The method of claim 2, wherein forming the liquid crystal layer includes at least one of: mixing liquid crystal material with a solvent sufficient to allow the liquid crystal to flow, wherein the solvent evaporates and leaves the liquid crystal layer behind; and depositing liquid crystal emulsion on the thinned region and directing an air blast to the emulsion.

6. The method of claim 1, wherein generating heat in the die circuitry includes heating the die using an external heat source.

7. The method of claim 1, wherein generating heat in the die circuitry includes coupling a power source to the die and electrically operating the die.

8. The method of claim 7, further comprising varying the output of the power source to change the heating rate of the circuitry within the die.

9. The method of claim 7, wherein electrically operating the die includes operating the die in a continuous loop that includes operational conditions that induce a circuit failure.

10. The method of claim 1, wherein detecting a defect in the die includes using a laser scanning microscope having a polarized light source and an analyzer.

11. The method of claim 1, wherein the testing arrangement includes a microscope, further comprising:

obtaining a reference image of circuitry;

using the microscope to obtain an image of the defect-related liquid crystal phase change in the die; and

superimposing the defect-related image over the reference image and providing a visual representation of the portion of circuitry having a defect.

12. The method of claim 11, wherein the reference image is of circuitry in a non-defective reference die having structure about identical to the die.

13. The method of claim 11, wherein the reference image is of circuitry in the die.

14. The method of claim 11, wherein using the microscope to obtain an image of the defect-related liquid crystal phase change in the die includes at least one of:

photographing the phase change and marking the phase change with a graphic marker.

15. The method of claim 11, further comprising using the superimposed defect image over the reference image to distinguish a liquid crystal phase change due to intrinsic heat sources from a liquid crystal phase change due to a defect.

16. The method of claim 7, wherein electrically operating the die comprises electrically operating a first circuit region and causing the first circuit region and a

second circuit region having a defect to effect a separately viewable phase change in corresponding areas of the liquid crystal layer, the first and second circuit regions being selected to cause the corresponding phase changes to cease to be separately viewable by conventional real-time analysis.

17. The method of claim 16, wherein detecting a defect in the die as a portion of the liquid crystal changing phase comprises detecting the liquid crystal phase change in the area corresponding to the second circuit region before the corresponding areas cease to be separately viewable.

18. The method of claim 1, further comprising cooling the die.

19. The method of claim 18, wherein cooling the die includes terminating the heat generation in the die, further comprising re-generating heat in the die circuitry and re-detecting the defect in the die after the die has cooled.

20. The method of claim 18, wherein cooling the die includes directing a cooling agent at the die, the cooling agent comprising at least one of: compressed air and compressed nitrogen.

21. A system for analyzing a flip chip die having a back side opposite circuitry at a circuit side and a liquid crystal layer, the system comprising:

means for providing a flip chip die having the liquid crystal layer formed over a thinned region in the back side;

means for generating heat in the die circuitry; and

means for testing the die, the testing means adapted to detect a defect as a portion of liquid crystal changing phase.

22. A system for analyzing a flip chip die, the flip chip die having a back side opposite circuitry at a circuit side and a liquid crystal layer, the system comprising:

an arrangement adapted to provide a flip chip die having the liquid crystal layer formed over a thinned region in the back side;

an heat generation arrangement adapted to generate heat in the die circuitry; and

a testing arrangement adapted to detect a defect in the die as a portion of the liquid crystal changing phase.

23. The system of claim 22, wherein the arrangement adapted to provide a flip chip die having a liquid crystal layer formed over a thinned region in the back side comprises:

a substrate removal device adapted to remove substrate from the back side of the flip chip die and form a thinned region; and

a deposition arrangement adapted to form a liquid crystal layer on the thinned region.

24. The system of claim 23, wherein the substrate removal device is further adapted to form a thinned region having sufficient surface qualities to adhere to the liquid crystal layer.

25. The system of claim 22, wherein the testing arrangement includes a microscope having a polarized light source and an analyzer.

26. The system of claim 25, wherein the microscope includes a laser scanning microscope.

27. The system of claim 26, wherein the laser scanning microscope is adapted to use emission microscopy to obtain an image of the die and to use an RGB function to superimpose the test image onto a reference image.

28. The system of claim 27, wherein the laser scanning microscope is adapted to produce a laser beam having a wavelength of about 1064 nanometers.

29. The system of claim 25, wherein the microscope includes a stage adapted to hold the die.

30. The system of claim 29, wherein the stage is adapted to move and to keep a selected portion of the die within the field of view of the microscope.

31. The system of claim 25, wherein the testing arrangement is adapted to record an image of the die as a function of time, the image being indicative of the liquid crystal changing phase.

32. The system of claim 31, wherein the testing arrangement includes a storage arrangement adapted to store image data.

33. The system of claim 32, wherein the storage arrangement is adapted to play back image data in slow motion.

34. The system of claim 31, wherein the testing arrangement includes a camera.

35. The system of claim 22, wherein the heat generation arrangement includes a power supply adapted to electrically operate the die.

36. The system of claim 35, wherein the power supply is adapted to respond to variations in the clock frequency supplied to the chip.